

## REMARKS

Claims 1-3 and 5-23 are pending in the present Application. Claims 21-23 were withdrawn from consideration, claims 1 and 19 have been amended and claim 9 has been canceled, leaving Claims 1-3 and 5-8 and 10-23 for consideration upon entry of the present Amendment.

Reconsideration and allowance of the claims are respectfully requested in view of the above amendments and the following remarks.

### Amended Claims

Claims 1 and 19 have been amended to better define the invention. Support for the amendment can be found at least in paragraph [0024] on page 6 of the specification as filed where it is stated that “a preferred polymeric mixture is a polycarbonate-cycloaliphatic mixture.” Additional support for the numerical weight percents claimed can be found in the examples of the present application as well as in the paragraph [0055] on pages 17 and 18. The examples of the present application show three compositions where the weight percent of polycarbonate is 50, 60 and 70 wt% respectively. (see paragraphs [0082] and [0099] respectively) In addition, the paragraph [0055] states that “Within this range, it is generally desirable to have the one of the polymers in an amount greater than or equal to about 20 wt%, preferably greater than or equal to about 30 wt% and more preferably greater than or equal to about 35 wt%, based on the total weight of the composition. Also desirable within this range, is an amount of less than or equal to about 90 wt%, preferably less than or equal to about 80 wt%, and more preferably less than or equal to about 70 wt% based on the total weight of the composition. A preferred mixture comprises 60 wt% polycarbonate and 40 wt% PCCD”. Combining the weight percent of polycarbonate specified in the Examples i.e., 50 wt% (from the Example 1) with the upper limit specified for the polymer in paragraph [0050] i.e., 90 wt%, the Applicants have arrived at the limits for the polycarbonate specified in the Claim 1. No new matter has been introduced by the amendment.

Claim Rejections Under 35 U.S.C. § 103(a)

Claims 1-3 and 5-18 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over U.S. Patent No.6,183,248 to Chishti et al. (hereinafter Chishti '248) in view of Conn et al (2002/0082360; hereinafter Conn). (Office Action dated 6/8/2006, page 2) Applicants respectfully traverse this rejection.

For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a *prima facie* case of obviousness, i.e., that all elements of the invention are disclosed in the prior art; that the prior art relied upon, coupled with knowledge generally available in the art at the time of the invention, contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or combined references; and that the proposed modification of the prior art had a reasonable expectation of success, determined from the vantage point of the skilled artisan at the time the invention was made. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988).

The claimed invention is directed to an appliance for use in an oral cavity, wherein the appliance comprises a stain resistant polymeric shell that has cavities designed to receive teeth, and wherein the shell comprises a thermoplastic polymeric mixture that comprises a polycarbonate and a cycloaliphatic polyester; wherein the polycarbonate is present in an amount of about 50 wt% to about 90 wt%; and wherein the weight percents are based on a total weight of a mixture that comprises polycarbonate and cycloaliphatic polyester. (Claim 1)

Chishti '248 teaches a polymeric overlay or shell having a teeth-receiving cavity formed therein. (see Abstract) Chishti '248 teaches that the shell comprises at least one layer of polymeric material. (see Claim 1) Chishti '248 discloses that the layer of polymeric material can be a shape memory polymer, methacrylate containing polymers, acrylate containing polymers, thermoplastic polymers, cross-linked thermoplastic polymers, thermoplastic polymer blends, cross-linked thermoplastic polymer blends, thermoplastic elastomer polymers, and thermoset polymers. (see Claim 6) Chishti '248 further teaches that a layer of the shell can comprise a

crosslinked polyester/polycarbonate blend in the Table in Col. 10. (see heading to the Table in Col. 10)

While Chishti '248 teaches that the shell can comprise thermoplastic polymer blends and thermoset polymers including a crosslinked polyester/polycarbonate blend, Chishti '248 does not specifically teach a shell that comprises a thermoplastic polymeric mixture that comprises a polycarbonate and a cycloaliphatic polyester as presently claimed. Chishti '248 does not teach a polycarbonate-cycloaliphatic polyester blend that is stain resistant. For this reason at least, Chishti '248 does not teach all elements of the claimed invention.

Conn teaches films formed from a blend of polycarbonate and a copolyester. (see Abstract) Conn teaches that the copolyester component of the blend at least one, or more of poly(1,4-cyclohexylene- dimethylene terephthalate) (PCT), poly(1,4-cyclohexylenedimethylene naphthalenedicarboxylate) (PCN), poly(1,4-cyclohexylenedimethylene 1,4-cyclohexanedicarboxylate) (PCC) copolyesters, or mixtures thereof. (see Page 1, paragraph [0011]) Conn teaches that the polycarbonate is present in an amount of 5 to 45 wt% based on the total weight of the composition. (see page 1, Paragraph [0009]) However, the blends of polycarbonate and copolyester disclosed by Conn undergo yellowing. (see page 3, paragraph [0029]) Conn also teaches that in order to prevent yellowing, a phosphite stabilizer must be added to the blend. (see page 3, paragraph [0029]) One of ordinary skill in the art desirous of making a dental appliance system for stabilizing teeth would prefer to use a material that does not undergo yellowing, as this would reduce the aesthetic appeal of the appliance.

The present application in contrast is directed to dental appliances that comprise a composition having about 50 to about 90 wt% polycarbonate. For this reason at least the combination of Chishti '248 with Conn does not teach all elements of the claimed invention.

In addition, the compositions disclosed by Conn that contain less than 45 wt% polycarbonate require the presence of a phosphite stabilizer to prevent yellowing. The claimed dental appliances in contrast do not require the presence of a phosphite stabilizer to prevent yellowing. For this reason at least, one of ordinary skill in the art upon reading Conn would be

demotivated from combining it with Chishti '248. Even if Conn were combined with Chishti '248 one of ordinary skill would not arrive at the claimed invention.

In addition, comparative testing documented in the present application shows unexpectedly superior results for the claimed composition. For example, Table 5 on page 32 shows that the presently claimed invention has a yellowness index  $b^*$  of 1.51 and 1.52 (see Sample 4 and 5) while comparative samples show a yellowness index  $b^*$  of 1.80 to 2.47 (see Comparative Samples 1 through 3). Quite clearly the claimed polycarbonate-polyester blends (comprising 50 wt% or more polycarbonate) do not undergo yellowing as compared with the blends disclosed by Conn and this is unexpected. In this regard, the courts have stated that "[A]n applicant can rebut a prima facie case of obviousness by presenting comparative test data showing that the claimed invention possesses unexpectedly improved properties or properties that the prior art does not have. *In re Dillon*, 919 F.2d 688, 692-93, 16 U.S.P.Q.2d 1987, 1901 (Fed. Cir. 1990).

In summary, the combination of Chishti '248 with Conn does not teach all elements of the claimed invention, there is no motivation to combine Chishti '248 with Conn, and the claimed invention displays unexpectedly superior results. For these reasons at least, the Examiner has not made a prima facie case of obviousness over Chishti '248 in view of Conn. Applicants respectfully request a withdrawal of the obviousness rejection over Chishti '248 in view of Conn.

Claims 19 and 20 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over U.S. Patent No.5,975,893 to Chishti et al. (hereinafter Chishti '893) in view of Chishti '248 and Conn. Applicants respectfully traverse this rejection.

Claim 19 is directed to a method for maintaining or repositioning teeth in the oral cavity comprising: placing an appliance in a patient's mouth, wherein the appliance comprises a stain resistant polymeric shell having cavities designed to receive teeth, and wherein the appliance comprises a polymeric mixture, that comprises a polycarbonate and a cycloaliphatic polyester; wherein the polycarbonate is present in an amount of about 50 wt% to about 90 wt%; and wherein the weight percents are based on a total weight of a mixture.

Chishti '893 teaches a system for repositioning teeth comprises a plurality of individual appliances. (see Abstract) Chishti '893 teaches that the appliances are configured to be placed successively on the patient's teeth and to incrementally reposition the teeth from an initial tooth arrangement, through a plurality of intermediate tooth arrangements, and to a final tooth arrangement. (see Abstract) While Chishti '893 describes that the appliances comprise a polymeric shell (see Claim 12) and further discloses that the polymeric shell is preferably formed from a thin sheet of a suitable elastomeric polymeric, such as Tru-Tain, commercially available from Tru-Tain Plastics, Rochester, Minn. 55902, Chishti '893 does not teach a shell that comprises a polymer mixture that comprises a polycarbonate and a cycloaliphatic polyester, especially one having more than 50 wt% polycarbonate. Chishti '893 further does not teach that the shell is stain resistant.

As noted above, Conn teaches a composition having less than 45 wt% polycarbonate. Conn therefore does not correct for the deficiency of Chishti '893. Furthermore, as described above, Chishti '248 and Conn fail to disclose a stain resistant polymeric shell that comprises a thermoplastic polymeric mixture that comprises a polycarbonate and a cycloaliphatic polyester that comprises more than 45 wt% polycarbonate. Chishti '893 fails to disclose a polymeric mixture and cannot remedy the deficiency of Chishti '248 and Conn. Therefore the combined teachings of Chishti '893, Chishti '248, and Conn cannot render obvious Claims 19 and 20. Reconsideration and withdrawal of this rejection are respectfully requested.

It is believed that the foregoing remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and withdrawal of the rejections and allowance of the case are respectfully requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 50-3621.

Respectfully submitted,

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